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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,466	01/28/2004	Charles Cobb	AFT0003	3625
25235	7590	08/05/2005	EXAMINER	
HOGAN & HARTSON LLP ONE TABOR CENTER, SUITE 1500 1200 SEVENTEENTH ST DENVER, CO 80202			FERNANDEZ, SUSAN EMILY	
			ART UNIT	PAPER NUMBER
			1651	

DATE MAILED: 08/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/767,466

Applicant(s)

COBB, CHARLES

Examiner

Susan E. Fernandez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/28/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

HC

### **DETAILED ACTION**

Claims 1-10 are pending and are presented for examination.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 is indefinite because it is not clear whether the enzymes beta-glucanase, amylase, and hemicellulase are exogenous. Thus, claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph.

Claim 4 is indefinite because of the phrase, "exogenous enzymes". It is not clear whether the "exogenous enzymes" are only exogenous phytase, exogenous cellulase, and exogenous pectinase. Thus, claim 4 is rejected under 35 U.S.C. 112, second paragraph.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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Claims 1, 3, and 5-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Maenz et al. (GB 2,340,727).

Maenz et al. recites a process for producing an animal feed comprising the step of converting the feed's phytate, a major storage form of phosphorus in plants (page 1, lines 10-12), into inorganic phosphate, which is a bio-available form (page 2, lines 13-15). See claim 15. The food which is treated by the methods recited by Maenz et al. can be any food which contains phytate (page 6, lines 11-12). Phytate conversion occurs by mixing a slurry comprising of phytase and the phytate-containing food (claim 1). Moreover, the slurry may further comprise of one or more enzymes, selected from the following: cellulase, xylanase (known as a hemicellulase), amylase, pectinase, and beta-glucanase (page 9, lines 12-20). Inclusion of these enzymes is a preferred embodiment, since "such enzymes may help to liberate the phytate from plant bodies rendering it more susceptible to the action of the phytase and/or act upon other of the food components in order to improve their digestibility" (page 9, lines 21-24). Thus, a holding of anticipation is clearly required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7, and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maenz et al. in view of Mantha (EP 57146).

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Maenz et al. recites a process for producing an animal feed comprising the step of converting the feed's phytate, a major storage form of phosphorus in plants (page 1, lines 10-12), into inorganic phosphate, which is a bio-available form (page 2, lines 13-15). See claim 15. The food which is treated by the methods recited by Maenz et al. can be any food which contains phytate (page 6, lines 11-12). Phytate conversion occurs by mixing a slurry comprising of phytase and the phytate-containing food (claim 1). Moreover, the slurry may further comprise of one or more enzymes, selected from the following: cellulase, xylanase (known as a hemicellulase), amylase, pectinase, and beta-glucanase (page 9, lines 12-20). Inclusion of these enzymes is a preferred embodiment, since "such enzymes may help to liberate the phytate from plant bodies rendering it more susceptible to the action of the phytase and/or act upon other of the food components in order to improve their digestibility" (page 9, lines 21-24).

Maenz et al. does not expressly disclose that the cellulase used for treating animal feed comprises a *Trichoderma viride* cellulase enzyme. Furthermore, it does not expressly disclose that any of the enzymes are derived from fermentation extracts of *A. oryzae*. Finally, Maenz et al. does not specify the animals which are fed the treated feed.

Mantha discloses a composition for increasing the milk production and the fat content of milk which comprises of amylase derived from *Aspergillus oryzae* and cellulase derived from *Trichoderma viride* (CAPLUS abstract).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have treated animal feed as disclosed by Maenz et al., with cellulase and amylase derived from *T. viride* and *A. oryzae*, respectively. One of ordinary skill in the art

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would have been motivated to do this since these particular enzymes would have had the added benefit of increasing milk production and fat content of milk when administered to dairy cows.

Additionally, at the time the invention was made, it would have been obvious to have administered the treated feed obtained by the Maenz invention to dairy cows and beef cattle. One of ordinary skill in the art would have been motivated to do this since it would have improved the digestibility of feed for dairy cows and beef cattle. Moreover, the conversion of phytate to inorganic phosphate would have been desirable since it would have improved the bio-availability of multivalent metal cations for any animal, including dairy cows and beef cattle which are fed plant material (page 1 of Maenz et al., lines 29-32). Finally, compositions comprising cellulase and amylase had been shown by Mantha to have been beneficial in increasing milk production and fat content of milk in dairy cows.

Therefore, a holding of obviousness is clearly required.

Claims 1 and 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maenz et al. in view of Tobey Jr. et al. (US 5,662,901).

As discussed above, Maenz et al. anticipates claims 1, 3, and 5-7.

Maenz et al. does not expressly disclose treating animal feed with exogenous enzymes obtained from all the fermentation extracts recited in claim 4. In addition, Maenz et al. does not disclose that the treated feed may be corn.

Tobey Jr. et al. discloses an enzymatic grain conditioner for the treatment of animal feed in order to increase the availability to the animal of starch, protein, and other nutrients found in the animal feed (column 1, lines 16-18). For the treatment of grains such as corn, Tobey Jr.

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advises that an appropriate grain conditioner should comprise of pectinase, beta-glucanase, amylase, and hemicellulase (column 9, lines 62-64). Preferred sources of these enzymes included *A. oryzae*, *A. niger*, and *B. subtilis* (column 5, lines 29-31, 65-67, and column 6, lines 9-11, 17-18).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have obtained the exogenous enzymes disclosed by Maenz et al. from *A. oryzae*, *A. niger*, and *B. subtilis*. One of ordinary skill in the art would have been motivated to do this since Tobey Jr. et al. disclosed that exogenous enzymes obtained from these sources are preferred in treating animal in order to improve feed utilization efficiency. The improvement of feed utilization efficiency was a reason Maenz et al. provided for the inclusion of other enzymes besides phytase in the treatment of animal feed (Maenz et al., page 9, lines 21-24).

Furthermore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have treated corn following the procedures disclosed by Maenz et al. One of ordinary skill in the art would have been motivated to do this since corn is a phytate-containing food. Additionally, Tobey Jr. had disclosed that exogenous enzymes are useful in treating corn.

Thus, a holding of obviousness is clearly required.

Claims 1, 3, and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maenz et al. in view of Nielsen et al. (US 5,989,600).

As discussed above, Maenz et al. anticipates claims 1, 3, and 5-7.

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However, Maenz et al. does not expressly disclose that the treatment of animal with multiple enzymes is performed sequentially in any order.

Nielsen et al. discloses a method for improving the solubility of vegetable proteins comprising the steps of: (a) treating the source with phytases, (b) treating the source with proteolytic enzymes, (c) treating the source with lipolytic/glucosidase enzymes (abstract, column 5, lines 7-21). These steps may be carried out as consecutive steps (column 5, lines 22-23). See also claims 14, 15, and 16.

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have modified the Maenz invention such that the addition of the enzymes to the animal feed had been performed sequentially.

One of ordinary skill in the art would have been motivated to do this since Nielsen et al., which had taught a similar method using similar enzymes, had indicated that the sequential addition of enzymes to a vegetable protein source was suitable for improving the solubility of vegetable proteins. Thus, a holding of obviousness is clearly required.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being obvious over Maenz et al. in view of Cobb et al. (US 6,623,750).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of



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invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

As discussed above, Maenz et al. anticipates claims 1, 3, and 5-7.

Maenz et al. does not expressly using cellulase obtained from *T. viride*, or exogenous enzymes obtained from the sources recited in claim 4. Additionally, Maenz et al. does not disclose that the treatment with enzymes occurs sequentially, that the treated feed is corn, or that the treated feed could be fed to dairy cows or beef cattle.

Cobb et al. discloses a method of increasing protein digestibility of a grain in ruminants comprising the steps of treating the grain with the following exogenous enzymes: pectinase, beta-glucanase, amylase, hemicellulase, and *T. viride* cellulase (claim 1). Furthermore, the treatment steps may be performed sequentially in any order. The ruminants may be dairy cows or beef cattle (claims 3 and 4). Finally, the enzymatic composition for treating the grain (such as corn) includes fermentation extracts of *A. niger*, *B. subtili*, *T. viride*, and *A. oryzae* (column 8, lines 1-7).

At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have proceeded to the methods of Cobb et al. following the treatment of animal

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feed with phytase as disclosed by Maenz et al. One of ordinary skill in the art would have been motivated to do this since Maenz et al. had pointed out that the inclusion of exogenous enzymes in addition to phytase in treating animal feed is desirable since "such enzymes may help to liberate the phytate from plant bodies rendering it more susceptible to the action of the phytase and/or act upon other of the food components in order to improve their digestibility" (page 9, lines 21-24). The Cobb invention had resulted in improved digestibility of a grain in ruminants, thus there would have been a reasonable expectation of success in combining the methods of Cobb to the methods of Maenz et al, which seek the same results.

Additionally, it would have been obvious to have treated corn with the above procedures, and have administered the treated feed to dairy cows and beef cattle. One of ordinary skill in the art would have been motivated to do this since the exogenous enzymes (except phytase) disclosed in both Maenz et al. and Cobb et al. had been shown in Cobb et al. to be useful in treating corn, where the treated feed may be fed to dairy cows and beef cattle.

Thus, a holding of obviousness is clearly required.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan E. Fernandez whose telephone number is (571) 272-3444. The examiner can normally be reached on Mon-Fri 8:30 am - 5:00 pm.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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